

### **REMARKS**

Claims 15 and 21 have been amended to remove any perceived inconsistency with Claim 1 with regard to the scope of “p and w”. Claim 18 has been returned to the form prior to the last amendment as suggested by the Examiner.

The Examiner’s attention is directed to the Enclosed Declaration Pursuant to 37 C.F.R. 1.132 of Stephen P. Singer. The Declaration details the results from comparing OLED devices containing the sterically hindered naphthyldiamine substituents useful in the HTL layer of the invention versus employing the same amine that is not sterically hindered. As the data shows, the hole transporting material of claim 1 provides a device that is 25% more stable (1.01 times NPB) than the corresponding compound without the steric hindering substituent (0.76 times NPB). NPB has other shortcomings such as the use of the carcinogen benzidine in its synthesis.

Turning now to the rejections based on Matsuura US 2005/0064233, in the prior amendment of February 7, 2007, at page 10, the Applicants pointed out that Matsuura only teaches the use of his aryl amines in a light emitting layer and not in a hole transporting layer as herein. The prior Office Action dated April 26 stated that certain specified compounds of Matsuura contained the bulky substituent and that, although the teachings of Matsuura are directed to the presence of the compounds in the light emitting layer (LEL), they are taught as hole transporting materials and so it would be obvious to use them in the hole transporting layer. Applicants respectfully disagree.

The reference is directed to the use of a combination of a hole transporting material that is an aryl amine and one of four electron transporting materials in a light emitting layer. There is no doubt that a conventional hole transporting layer is all that is contemplated by the reference. (See Matsuura paragraphs [0099], [0108], [0112], [0113], [0123], [0132], [0133], and [0148]). Matsuura only suggests that a combination of components in the LEL will improve stability and color purity. There is no suggestion or basis for predicting that a relatively narrow selection from just one of the components when used in a totally different layer will improve stability.

Looking at the data of Matsuura, it appears that the combination of materials produces good results without any regard to the presence of bulky groups. It appears that any aryl amine can accomplish the results if used in the combination and in the LEL layer. It is noted however that the arylamines H4 and H5 in Table 1-2 apparently do not provide the desired improvement although being within the description of Matsuura and casting doubt on the clarity of Matsuura's disclosure.

The enclosed Declaration Under Rule 132 demonstrates the need for the sterically hindered group. A 25% improvement is obtained by employing the bulky substituent. There is no basis for concluding there would be a stabilizing effect from using in a hole transport layer a narrowly selected individual member of the LEL combination of the reference. Even when used in the combination of Matsuura in the LEL, the examples using a bulky substituent (Examples 21-23), do not evidence a stability advantage over those without the substituent. (See Table 2-2 where the stability ranges from 1000-2350 for Examples 21-23, and from 900 to 4350 for those without a bulky substituent.

There has been shown no reason why one of ordinary skill in the art would have had any way to predict that separating a selected narrow range of aryl amine from its essential combination and putting it in a wholly different layer would improve the stability of the emission property of the device. The mere fact that the arylamine compound is disclosed as a hole transporting compound does not lead to the selection of the particular subclass of the claims nor the beneficial stability results outside the combination.

Turning to swearing back of Matsuura, the previously filed Declaration speaks as of prior to April 2, 2003 which is prior to July 11, 2003 and is sufficient to overcome the Matsuura reference. The present invention is not directed to a chemical compound, *per se*. The present invention is directed to the hole transporting layer of an OLED device and a certain type of compound used therein. The Matsuura reference uses some chemical species included within the present claims but in a totally different layer and always in an essential combination in that layer. Thus, although the identified chemical compounds are within the description of the present claims, the disclosure of Matsuura does not suggest a species of invention within the present claims. Accordingly, it is reasonable to accept Applicants' Declaration with respect to several species as

sufficient evidence of prior discovery of his generic invention over the particular species of Matsuura.

Turning to Parton, US 2003/0129449, Claims 1-16, 18-25 and 28-33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Parton et al. (US 2003/0129449 A1) for reasons of record in the Office action mailed April 26, 2007 with the following modification. According to the Examiner:

The declaration filed on July 30, 2007 under 37 CFR 1.131 has been considered but is ineffective to overcome the rejection based on the Parton et al. reference.

The Parton et al. reference is a U.S. patent or U.S. patent application publication of a pending or patented application that claims the rejected invention. An affidavit or declaration is inappropriate under 37 CFR 1.131(a) when the reference is claiming the same patentable invention, see MPEP § 2306. (Note that the “same patentable invention” as used here includes inventions that are obvious over each other.) If the reference and this application are not commonly owned, the reference can only be overcome by establishing priority of invention through interference proceedings. See MPEP Chapter 2300 for information on initiating interference proceedings. If the reference and this application are commonly owned, the reference may be disqualified as prior art by an affidavit or declaration under 37 CFR 1.140. See MPEP § 718.

Even if applicant were to persuade the examiner that the reference is not claiming the same patentable invention, it is the examiner’s position that the Rule 131 Declaration is insufficient to overcome the rejection based on the Parton et al. publication because the evidence submitted is insufficient to establish a reduction to practice of the invention in this country or a NAFTA or WTO member country prior to the effective date of the reference. Parton’s priority application No. 09/933,278, filed September 28, 2001, provides support for Parton’s teachings that are relied upon in rejecting the claims under 35 U.S.C. 103(a). The Rule 131 Declaration speaks of dates prior to April 2, 2003. It is not clear that the dates prior to April 2, 2003 are necessarily prior to September 28, 2001.

It is Applicants position that the previously submitted Declaration Under Rule 131 is sufficient to overcome the rejection under 35 USC 103 through 35 USC 102(a), and, the rejection through 102(a) having been removed, the previously submitted Statement of Common Ownership is sufficient to overcome any rejection under 35 USC 103 through 35 USC 102(e).

Applicants respectfully disagree with the Examiner's interpretation of the requirements of a Rule 131 Declaration. According to the MPEP Section 715, under the subtitle "Reference Date to be Overcome", it is provided that "The date to be overcome...is the effective date of the reference (i.e., the date on which the reference is available as prior art)." The effective date of a reference under 35 USC 102(a) is its publication date, not an effective filing or other prior filing date. Applicants need not overcome the earlier 2001 and 2002 filing dates of the Parton prior art.

The enclosed Declaration Pursuant to 37 C.F.R. 1.132 serves to obviate the outstanding rejection. The Office Action relies on the conclusion that the present invention is obvious over the prior invention of Parton. The Declaration demonstrates that compounds of the invention containing bulky substituents on the naphthylene nucleus are patentably distinct and exhibit a 25% improved stability effect compared to the best mode compounds of the prior Parton publication. Such an improvement is not within normal variation, was not predictable from the Parton teachings, contains different claim limitations, and is not the "same invention" as suggested in the Office Action.

In view of the foregoing amendments, submissions, and remarks, the Examiner is respectfully requested to withdraw the outstanding rejection and to pass the subject application to Allowance.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Encl: Declaration Pursuant to 37 C.F.R. 132

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Richard L. Parton, et al

ORGANIC ELEMENT FOR  
ELECTROLUMINESCENT DEVICES

Serial No. 10/810,282

Filed 26 March 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA. 22313-1450

Group Art Unit: 1774

Examiner: Marie Rose Yamnitzky

Sir:

**DECLARATION PURSUANT TO 37 C.F.R. 1.132**

The undersigned, Stephen P. Singer, of the county of Monroe, State of New York, declares that:

He received the degree of B.S. in Chemistry from Clarkson College of Technology in 1973 and the degree of Ph. D. in Organic Chemistry from the Massachusetts Institute of Technology in 1977;

He has been employed in the research laboratories of Eastman Kodak since 1978;

He is an Intellectual Property Coordinator in the area of Organic Light Emitting Diode research for Eastman Kodak Company, and as such has access to the laboratory notebooks and other research data obtained in the ordinary course of business;

He is familiar with the content of the above-captioned application;

He confirms that none of the four inventors in the above-captioned application is still employed at this time by the assignee of the present application, Eastman Kodak Co;

In his capacity as Intellectual Property Coordinator in the area of Organic Light Emitting Diode research he reviewed the existing data obtained in the

ordinary course of research of Eastman Kodak including test results obtained using hole-transporting compounds useful in the invention, containing t-butyl sterically hindering groups on the naphthylene nucleus, versus the same compound not containing such bulky naphthylene nucleus substituent groups, and among those results were the following:

Samples were prepared and tested as follows:

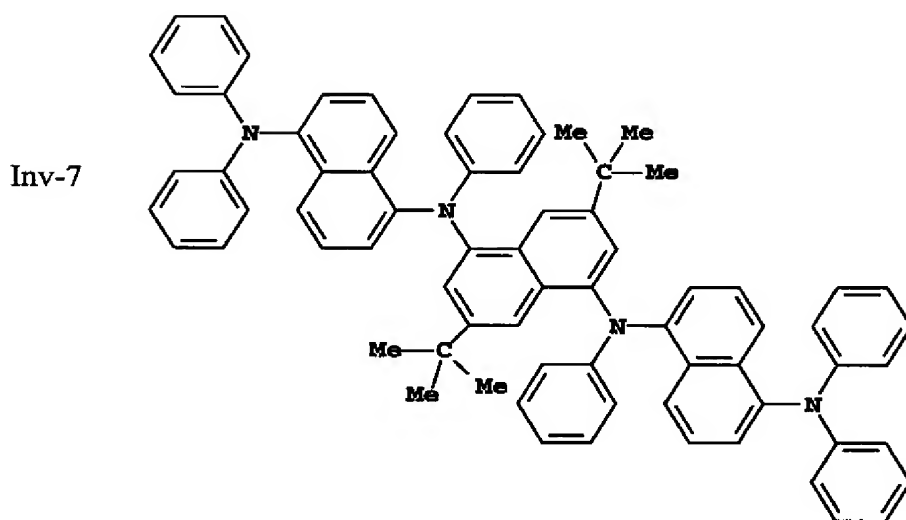
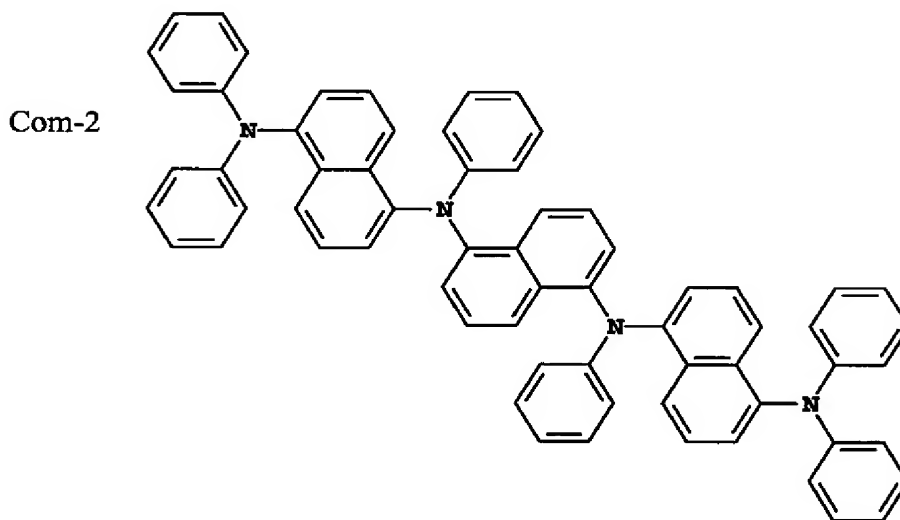
EL devices (Samples 1 and 2) were constructed in the following manner:

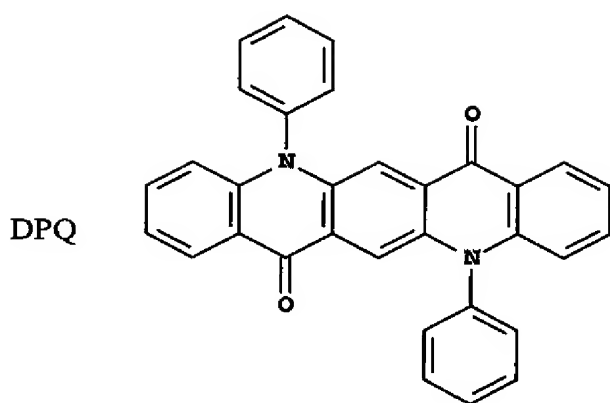
1. A glass substrate coated with an 85 nm layer of indium-tin oxide (ITO) as the anode was sequentially ultrasonicated in a commercial detergent, rinsed in deionized water, degreased in toluene vapor and exposed to oxygen plasma for about 1 min.
2. Over the ITO was deposited a 1 nm fluorocarbon (CF<sub>x</sub>) hole-injecting layer (HIL) by plasma-assisted deposition of CHF<sub>3</sub>.
3. A hole-transporting layer (HTL) of either NPB or Com-1 (structure below) having a thickness of 75 nm was then evaporated from a tantalum boat.
4. A 75 nm light-emitting layer (LEL) of tris(8-quinolinolato)aluminum (III) (AlQ<sub>3</sub>) was then deposited onto the hole-transporting layer. This material was also evaporated from tantalum boats.
5. On top of the AlQ<sub>3</sub> layer was deposited a 220 nm cathode formed of a 10:1 volume ratio of Mg and Ag.

EL devices (Sample 3 and 4) were constructed in the following manner:

1. A glass substrate coated with an 85 nm layer of indium-tin oxide (ITO) as the anode was sequentially ultrasonicated in a commercial detergent, rinsed in deionized water, degreased in toluene vapor and exposed to oxygen plasma for about 1 min.
2. Over the ITO was deposited a 1 nm fluorocarbon (CF<sub>x</sub>) hole-injecting layer (HIL) by plasma-assisted deposition of CHF<sub>3</sub>.
3. A hole-transporting layer (HTL) of NPB (4,4'-Bis[*N*-(1-naphthyl)-*N*-phenylamino]biphenyl) or Inv-7 having a thickness of 75 nm was then evaporated from a tantalum boat.
4. A 37.5 nm light-emitting layer (LEL) of tris(8-quinolinolato)aluminum (III) (AlQ<sub>3</sub>) and dopant DPQ (0.6 wt%, see structure below) were then deposited onto the hole-transporting layer. These materials were also evaporated from tantalum boats.

5. A 37.5 nm electron-transporting layer (ETL) of tris(8-quinolinolato)aluminum (III) ( $\text{AlQ}_3$ ) was then deposited onto the light-emitting layer. This material was also evaporated from a tantalum boat.
6. On top of the  $\text{AlQ}_3$  layer was deposited a 220 nm cathode formed of a 10:1 volume ratio of Mg and Ag.





The above sequences completed the deposition of the EL devices. The devices were then hermetically packaged in a dry glove box for protection against ambient environment.

The cells thus formed were tested for stability in the form of luminance ( $\text{cd/m}^2$ ) at a current density of  $20 \text{ mA/cm}^2$  by operating them for greater than 200 hours at room temperature. % Fade is the decrease in luminance from the initial value to the final value.

**Table 1 - Stability of Test OLED Devices**

Example	HTL	% Fade	Relative to NPB Internal Control
1 (Comparative)	NPB	83.6%	
2 (Comparative)	Com-2	63.3%	0.76x
3 (Comparative)	NPB	75.8%	
4 (Inventive)	Inv-7	76.5%	1.01x

Inv-7 is a compound that meets all of the requirements of currently amended Claim 1 where  $R^1$  and  $R^2$  are t-butyl groups which are sterically bulky groups with a B1 value = 2.59 (see Table A of the specification),  $Ar^a$  is a naphthalene group,  $Ar^b$  is a phenyl group and p, w, m, n are all equal to 1. Com-2 is analogous to Inv-7 except it has no sterically bulky  $R^1$  and  $R^2$  groups. Examples 1 and 2 were prepared in slightly different formats from Examples 3 and 4, but the HTL layers in all 4 examples are exactly the same thickness. It is believed that the minor change in format would have not have a significant effect on the relative performance of the two test compounds vs the same internal check



compound NPB. Results are reported as a ratio of that obtained with NPB in the same format. As the results in Table 1 demonstrate, Com-2, lacking the sterically bulky groups on the naphthylene nucleus according to the invention, is significantly less stable than NPB whereas Inv-2 has stability on a par with NPB and is decidedly improved over the direct comparison.

The 25% improvement in stability is outside the usual expectation for variability. I would not have expected these results prior to testing.

The undersigned declares that all statements made herein of the undersigned's own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: Nov 30, 2007

  
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Stephen P. Singer